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NATURAL DISASTER REDUCTION: HAZARD RESISTANT STRUCTURES

Technical session

Addendum

Reconditioning of existing adobe housing to mitigate the effects of earthquakes

Summary of presentation by Professor Alberto A. Giesecke, Director, Centro Regional de Sismologia para America del Sur (CERESIS), Peru, and member of the Scientific and Technical Committee for the International Decade for Natural Disaster Reduction

1. Considerable work has been done throughout the world to produce new technology for adequate construction with adobe. Such efforts, however, do not mitigate the impact of future large earthquakes on existing adobe housing, since these technologies are not applicable, in general, for reconditioning older houses. It is therefore urgent and very important to address the problem faced by millions of people who live in adobe housing hoping they are lucky enough during their lifetime to be spared the occurrence of a destructive earthquake.

2. The problems with adobe construction when subjected to ground shaking are due to non-engineered construction, the inherent mechanical limitations of the material, massive yet fragile and low-resistant walls, and configuration defects that enhance the problem, such as long walls without transversal bracing elements, excessive height from floor to ceiling, inadequate wall to wall and wall to roof joints, and foundations in soft soils. After each important earthquake, a series of brochures and manuals are prepared and

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distributed, with an assortment of recommendations to improve the seismic resistance of adobe constructions, many of them with contradictory appreciations and, generally, without the benefit of laboratory or field tests to guarantee performance.

3. The basic concept of the CERESIS project is to evaluate and establish simple, low-cost procedures for reconditioning existing adobe housing, taking into account the type of soil on which they are built, and the size, shape and construction characteristics, so that they will resist seismic excitation at least to the extent that the occupants, when a severe earthquake occurs, will have enough time to get outside before the house collapses. The objective is to save lives. Tests of these procedures are being carried out on large-scale models using a large shaking table, which simulates earthquake-induced ground motion.

4. The project includes strategies to develop the proper methodology that would motivate the populations to carry out by themselves the recommended reconditioning without the help of outside experts or external financial aid.